Computer and Information Systems Engineering Career Area

Job Roles

The job roles in the Computer and Information Systems Engineering Career Area include the following competencies:

- ***Architecture & Standards***

  Definition: promotes the development, adoption, specification, certification, and application of information technology architecture and standards.

  1. Architecture
  2. Standards
  3. Human Computer Interface
  4. Configuration Management
  5. Requirements Analysis
  6. Integration and Interoperability Engineering
  7. Common Operating Environment
  8. Systems Integration
  9. Developmental Test and Evaluation
  10. Program Management
  11. Contracting Officer's Representative
  12. Information Assurance

- ***Data Management***

  Definition: develops, organizes, and maintains a data architecture.

  1. Data Maintenance
  2. Electronic Data Interchange
  3. Standards
  4. Configuration Management
  5. Quality Assurance
  6. Requirements Analysis
  7. Common Operating Environment
  8. Computer Systems Architecture
  9. Information Assurance
  10. Modeling and Simulation
  11. Program Management
  12. Contracting Officer's Representative

- ***Project Management***

  Definition: within the Computer and Information Systems Engineering area, supports the acquisition of required hardware, software, support systems, and other materials while ensuring the adherence to Federal Law and DoD and DON life cycle management regulations; provides guidance for system oversight, reviews, and milestone approval for DON-managed information system programs; manages contracts and related supplier management functions; performs Contracting Officer's Representative (COR) functions.

1. Systems Development
2. Systems Acquisition
3. Information Technology, Information Management, Knowledge Management
4. Business Development
5. Quality Assurance
6. Configuration Management
7. Risk Management
8. Architecture
9. Business Process Reengineering
10. E-Business
11. Life Cycle Management
12. Requirements Analysis
13. Requirements Management
14. Program Management
15. Contracting Officer's Representative
16. Information Assurance

❖ ***Research & Development***

Definition: conducts basic scientific research and applies research to advanced technologies and prototypes for computer and communications systems.

1. Basic Scientific Research
2. Applied Research
3. Advanced Concept Technology Demonstrations
4. Requirements Analysis
5. Modeling and Simulation
6. Program Management
7. Contracting Officer's Representative
8. Information Assurance

❖ ***Software Engineering***

Definition: develops, tests, operates, implements, and maintains DON software systems, as well as selects commercial off-the-shelf software; also oversees these functions.

1. Software Development
2. Software Reuse
3. Computer Aided Software Engineering
4. Human Computer Interface
5. Common Operating Environment
6. Computer Systems Architecture
7. Requirements Management
8. Configuration Management
9. Systems Integration
10. Standards
11. Testing
12. Life Cycle Management
13. Program Management
14. Contracting Officer's Representative
15. Information Assurance

❖ ***System Analysis***

Definition: identifies, collects and analyzes customer/user requirements; distributes and allocates these requirements to system and subsystem levels.

1. Requirements Analysis
2. Modeling and Simulation
3. Architecture
4. Human Computer Interface
5. Operations Research
6. Configuration Management
7. Computer Aided Software Engineering
8. Business Process Reengineering
9. Program Management
10. Contracting Officer's Representative
11. Information Assurance

❖ ***Systems Engineering***

Definition: integrates information system components including hardware, software, data, policy, procedures and users to produce a working system; integrates information systems with the external environment while focusing on reusability, interoperability, standards, security, and other factors.

1. Requirements Analysis
2. Computer Systems Architecture
3. Systems Integration
4. Software Development
5. Software Reuse
6. Computer Aided Software Engineering
7. Human Computer Interface
8. Common Operating Environment
9. Network Engineering
10. Integrated Network Management
11. Operational Test and Evaluation
12. Integrated Verification and Validation
13. Reliability
14. Configuration Management
15. Operations Research
16. Program Management
17. Contracting Officer's Representative
18. Information Assurance

❖ ***Test & Evaluation***

Definition: conducts all aspects of testing for a system's life cycle, including developmental, operational, and integration testing and evaluation; individuals pursuing this discipline should have working knowledge of the testing and evaluation tools and techniques used to evaluate software and information systems.

1. Developmental Test and Evaluation
2. Integrated Verification and Validation
3. Integration Testing

4. Operational Test and Evaluation
5. Quality Assurance
6. Testing
7. Reliability
8. Computer Aided Software Engineering
9. Program Management
10. Contracting Officer's Representative
11. Information Assurance

❖ ***Systems Administration***

Definition: uses tools and methods to operate, test, maintain and manage computer systems and networks which store, transfer, and manipulate data; integrates mainframe, mid-tier, personal computers, associated networks, and systems software components to provide data processing support, products, and services to customers. *This job role is not considered inherently governmental.*

1. Computer Operations Management
2. Network Management
3. Computer Systems Architecture
4. Operational Test and Evaluation
5. Business Development
6. Information Assurance

Competencies by Job Role

The following table illustrates the breakout of competencies (along the left hand side) by job role (across the top) within this career area:

Competency:	Architecture and Standards	Data Management	Project Management	Research and Development	Software Engineering	Systems Administration	Systems Analysis	Systems Engineering	Test and Evaluation
Advanced Concept Technology Demonstration				●					
Applied Research				●					
Architecture	●		●				●		
Basic Scientific Research				●					
Business Development			●			●			
Business Process Reengineering			●				●		
Common Operating Environment	●	●			●			●	
Computer Aided Software Engineering (CASE)					●		●	●	●
Computer Operations Management						●			
Computer Systems Architecture		●			●	●		●	
Configuration Management	●	●	●		●		●	●	
Contracting Officers Representative (COR)	●	●	●	●	●		●	●	●
Data Maintenance		●							
Developmental Test & Evaluation (DT&E)	●								●
E-Business		●	●						
Human Computer Interface	●				●		●	●	
Information Assurance	●	●	●	●	●	●	●	●	●
Information Technology, Information Management, Knowledge Management			●						
Integrated Network Management								●	
Integrated Verification & Validation (IV&V)								●	●
Integration & Interoperability Engineering	●								
Integration Testing									●
Life Cycle Management			●		●				
Modeling and Simulation		●		●			●		
Network Engineering								●	
Network Management						●			
Operational Test & Evaluation (OT&E)						●		●	●
Operations Research							●	●	
Program Management	●	●	●	●	●		●	●	●
Quality Assurance			●						●
Reliability								●	●

Competency:	Architecture and Standards	Data Management	Project Management	Research and Development	Software Engineering	Systems Administration	Systems Analysis	Systems Engineering	Test and Evaluation
Requirements Analysis	●	●	●	●			●	●	
Requirements Management			●		●				
Risk Management			●						
Software Development					●			●	
Software Reuse					●			●	
Standards	●	●	●		●				
System Integration	●				●			●	
Systems Acquisition			●						
Systems Development			●						
Testing					●				●

Job Roles by Occupational Series

The following table presents a matrix of the occupational series (on the left side) by the job roles in this career area (across the top). It is offered as general guidance to help identify where the work performed in the various job roles may be found in the federal government workforce. As such, it does not depict every situation that could occur. More detailed information on the draft classification standard for the Information Technology specialist (GS-2200) can be found in Appendix B of Volume I.

	Architecture & Standards	Data Management	Project Management	Research & Development	Software Engineering	Systems Analysis	Systems Engineering	Test & Evaluation	* Systems Administration
GS-301 Misc. Admin. and Program		●							
GS-303 Misc. Clerk and Assistant		●							
GS-335 Computer Clerk & Assistant		●							●
GS-340 Program Management	●		●			●			
GS-343 Management & Program Analysis	●		●			●			
GS-391 Telecommunications	●		●	●			●		●
GS-854 Computer Engineer	●		●	●	●		●		
GS-855 Electronics Engineer	●				●		●		
GS-856 Electronics Technician					●				
GS-1550 Computer Science	●			●	●	●	●		
GS-2210[1] IT Management	●	●	●	●	●	●	●	●	●

[1] Formerly GS-334 Computer Specialist.

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

1 Competency: **Architecture**

Strategic Value:

To provide secure information systems that are efficient, effective, interoperable, scalable, reliable, integrated and affordable.

Learning Objectives:

Understanding the operational, systems and technical views of the architecture framework endorsed by DoD, and their application in computer and information systems components.

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- OMB Memo M-97-16
- C4ISR architecture framework
- Process modeling
- Data interchange services
- Computer systems architecture
- System design, including hardware components and configuration
- Database management
- Distributed processing
- Operating Systems
- Networks
- Systems software
- Technical Standards--their role and specific standards in use and adopted by DoD and DON
- Cryptographic equipment and systems
- DoD Security Architecture (MSL)

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

2 Competency: **Standards**

Strategic Value:

To promote interoperability, security, portability and scalability by ensuring requirements are inserted into standards development efforts, developing standards profiles and promoting the development of standards compliant products.

Learning Objectives:

Knowledge of and ability to develop and maintain standards and to influence standards development and standards development bodies.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Standards development process
- Standards development bodies
- Standards-based open systems architecture
- Reference models
- Profiles of standards (e.g., DoD Technical Reference Model, Technical Architecture Framework for Information Management, Information Technology Standards Guidance, IEEE Open Systems Reference Model, NIST Applications Portability Profile)
- Test & Evaluation
- Reference Implementations
- Standards compliance
- Standards selection

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend specific courses on standards (E, I, J)
- Attend standards symposiums and technical conferences (I, J)
- Subscribe to technical journals (E, I, J, S)

Work-based:
- Serve on standards committees (J, S)
- Serve on staff positions related to standards (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

3 Competency: **Human Computer Interface**

Strategic Value:

To provide guidance to system developers in areas such as design, operation and maintenance of displays, operator controls and training programs. To ensure human computer interfaces are designed for usability with the needs, capabilities, and limitations of the users in mind and in accordance with DoD regulations.

Learning Objectives:

Knowledge of and ability to apply human factors principles, methods, tools and guidance.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Human factors principles, methods and tools
- Human-machine systems (human-in-the-loop)
- Human factors engineering
- Design, operation and maintenance of displays, operator controls, and training programs
- Ergonomics
- Safety
- Federal and DoD human-computer interface regulations and guidelines
- Human factors engineering principles
- Accessibility
- Human subjects experiments

Developmental Opportunities:

Learning:
- Attend Human Computer Interface conferences (I, J)
- Take human factors engineering course (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

4 Competency: **Configuration Management**

Strategic Value:

To ensure sound configuration management processes are established for information systems, to document mission support software and systems and to manage the configuration of existing networks.

Learning Objectives:

Knowledge of and ability to identify, track (status accounting), control, and document information and physical characteristics of an information system or product (including documentation during a system's life cycle).

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Configuration management tools and methods
- Tracking (status accounting), controlling and documenting information and physical characteristics of an information system or product
-Configuration reviews and functional and physical auditing
- DoD policies and guidelines
- Protection of software (trusted)

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend formal CM training (E, I)
- Attend CM conferences (I, J, S)

Work-based:
- Participate in writing of CM plan (I, J)
- Participate in a CM audit (I, J)
- Serve on a configuration control board (I, J)
- Attend a CCB meeting (E)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

5 Competency: **Requirements Analysis**

Strategic Value:

To ensure stakeholder (e.g. customers, end-users) requirements are incorporated in the systems engineering of information systems.

Learning Objectives:

Knowledge of and ability to identify, specify, analyze and manage customers' functional and infrastructure requirements.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD, DON mission, organization and roles
- Mission support requirements
- Analysis tools and methods
- Stakeholder (e.g., fleet, resource sponsor, end user, program office) requirements
- Standards requirements specification
- Operations and logistics requirements

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend course on Requirements Specification (E, I)

Work-based:
- Work on specification writing team (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

6 Competency: **Integration & Interoperability Engineering**

Strategic Value:

To provide effective integration and interoperability with government elements, provide better use and sharing of existing government components, and use government resources more effectively. To develop strategies to ensure system security, interoperability, portability and scalability.

Learning Objectives:

Knowledge of and ability to optimize systems, interfaces and interdependencies and focus on effective resource utilization.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4		X	X	X	X

Skill Topics:

- Methods, tools and processes for integration and interoperability
- Customer guidance
- Joint interoperability
- Information Assurance
- Joint requirements

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)
- Attend community wide conferences to build knowledge base (I, J)

Work-based:
- Participate in integration testing (I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

7 Competency: **Common Operating Environment**

Strategic Value:

To enable the continued development of applications that run on the Defense Information Infrastructure Common Operating Environment (DII COE), to promote standard interfaces and to promote interoperability.

Learning Objectives:

Knowledge of and ability to apply a theoretical and practical understanding of the Joint Technical Architecture and the Common Operating Environment.

Proficiency:		Level:					
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4		X	X	X	

Skill Topics:

- Systems architectures
- Software Engineering
- Applications engineering
- Data engineering
- Information assurance
- Other IT skills (OS, systems interoperability and COE compliance, open systems standards, object oriented technology, multimedia, groupware technology, large scale systems)

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)
- Defense Information Systems Agency courses on DII COE (all)

Work-based:
- Develop COE compliant segments (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

8 Competency: **System Integration**

Strategic Value:

To manage the integration of subsystems into a system.

Learning Objectives:

Knowledge of and ability to integrate large information systems.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4		X	X	X	

Skill Topics:

- Integration methods, tools and metrics
- System interoperability
- Software portability
- Software scalability
- System security
- System and interface testing
- DoD and DON Enterprise migration strategies
- Analysis, identification and resolution of flaws
- Interface definition
- Interface configuration management

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)
- System engineering course (I)
- Attend system engineering symposia (I, J, S)
- Present at system engineering symposia (J, S)

Work-based:
- Participate in interface design specification (I)
- Participate in integration testing (I)
- Management and supervisor training courses (J, S, Ex)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

9 Competency: **Developmental Test & Evaluation (DT&E)**

Strategic Value:

To promote the development and acceptance of information systems to meet stakeholder requirements; to promote compliance with standards; to promote interoperability of standards compliant products in support of DON acquisition.

Learning Objectives:

Knowledge of and ability to analyze the technical characteristics, identify critical technical issues and design, implement, execute and report results.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DT&E
- Requirements and developmental analysis
- Test coverage performance metrics
- Quality assurance
- Performance assurance
- Product assurance
- Standards conformance testing
- Interoperability certification
- Security testing
- IV&V

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend testing conferences, such as ITEA conference (I, J)
- Attend courses on test design (E, I)

Gap Assessment:

Required Proficiency	-	Current Proficiency	=	Gap
	-		=	

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

10 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
 --Information Management Planning
 --Information Technology Acquisition for the CIO
 --IT Project Management- STAR Program (all)
- DAWIA (all

)Work-based:
- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

11	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval - Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones - Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Architecture and Standards

12 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

1	Competency: **Data Maintenance**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To oversee the maintenance and management of data across the enterprise and be responsible for central information planning and control.*	Learning Objectives: Knowledge of and ability to develop and maintain a data architecture and provide the basis for the incremental, ordered design and development of systems based on successively more detailed levels of data modeling.	0 1 2 3 4	0 1 2 3 4	X	X	X			- DoD Data Administration - DII COE Shared Data Environment (SHADE) - C4ISR Core Architecture Data Model (CADM) - Commercial business practices (e.g., Enterprise Resource Planning)
	Developmental Opportunities: Learning: - Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all) - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: ____ - ____ = ____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

2 Competency: **E-Business**

Strategic Value:

To conduct business in an integrated and automated paperless information environment

Learning Objectives:

Knowledge of and ability to develop and apply electronic commerce tools and electronic data interchange policy, practices, standards, and procedures.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Electronic mail
- Electronic bulletin board systems
- Electronic funds transfer
- Business Process Evaluation/Reengineering
- Economic/Cost Benefit Analysis
- Project Planning/Development
- Enterprise Integration/Implementation
- EC/EDI Standards Coordination/Development Support
- Training and awareness
- WWW development and support

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Information Resources Management College, Strategic Management of Websites (I, J, S)
- Attend electronic commerce web design course (E, I)

Work-based:
- Provide engineering support to electronic commerce project (E, I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

3 Competency: **Standards**

Strategic Value:

To promote interoperability, security, portability and scalability by ensuring requirements are inserted into standards development efforts, developing standards profiles and promoting the development of standards compliant products.

Learning Objectives:

Knowledge of and ability to develop and maintain standards and to influence standards development and standards development bodies.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Standards development process
- Standards development bodies
- Standards-based open systems architecture
- Reference models
- Profiles of standards (e.g., DoD Technical Reference Model, Technical Architecture Framework for Information Management, Information Technology Standards Guidance, IEEE Open Systems Reference Model, NIST Applications Portability Profile)

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend other courses on standards (E, I)
- Attend standards symposiums and technical conferences (I, J)
- Subscribe to technical journals (E, I, J, S)

Work-based:
- Serve on standards committees (J, S, Ex)
- Serve on staff positions related to standards (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

4 Competency: **Configuration Management**

Strategic Value:

To ensure sound configuration management processes are established for information systems, to document mission support software and systems and to manage the configuration of existing networks.

Learning Objectives:

Knowledge of and ability to identify, track (status accounting), control, and document information and physical characteristics of an information system or product (including documentation during a system's life cycle).

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend formal CM training (E, I)
- Attend CM conferences (all)Work-based:- Participate in writing of CM plan (I, J)
- Participate in a CM audit (I, J)
- Serve on a configuration control board (all)
- Attend a CCB meeting (E)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Configuration management tools and methods
- Tracking (status accounting), controlling and documenting information and physical characteristics of an information system or product
- Configuration reviews and functional and physical auditing
- DoD policies and guidelines
- Protection of software from malicious code

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

5 Competency: **Quality Assurance**

Strategic Value:

To design, develop and deploy high quality systems by employing tools and methods that manage the system evolution.

Learning Objectives:

Knowledge of and ability to apply principles, methods and tools of quality assurance; includes translating functional requirements into technical requirements used for logical design or presenting alternative technologies or approaches.

Proficiency:		Level:					
Current	Required	E	I	J	S	Ex	Skill Topics:
0 1 2 3 4	0 1 2 3 4	X	X	X	X		- Stakeholder requirements - Testing processes and procedures - OT&E - DT&E - IV&V - Performance measurement - Software metrics - Design reviews

Developmental Opportunities:

Learning:
- Center for Quality Management courses (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____	-	_____	=	_____
Required Proficiency	-	Current Proficiency	=	Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

6 Competency: **Requirements Analysis**

Strategic Value:

To ensure stakeholder (e.g. customers, end-users) requirements are incorporated in the systems engineering of information systems.

Learning Objectives:

Knowledge of and ability to analyze, identify, specify and manage functional and infrastructure requirements needed to achieve customer, organization and DON goals.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD mission, organization and roles- DoD Components' (Services and Agencies) missions, organizations and roles
- Unified Command structure, mission and roles
- Mission support requirements- Analysis tools and methods
- Stakeholder requirements
- Operations and logistics requirements
- Security requirements

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend course on Requirements Specification (E, I)

Work-based:
- Work on specification writing team (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

7 Competency: **Common Operating Environment**

Strategic Value:

To enable the continued development of applications that run on the Defense Information Infrastructure Common Operating Environment (DII COE), to promote standard interfaces and to promote interoperability.

Learning Objectives:

Knowledge of and ability to apply a theoretical and practical understanding of the Joint Technical Architecture and the Common Operating Environment.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4		X	X	X	

Skill Topics:

- Systems architectures
- Software Engineering
- Applications engineering
- Data engineering
- Information assurance
- Other IT skills (OS, systems interoperability and COE compliance, open systems standards, object oriented technology, multimedia, groupware technology, large scale systems)

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)
- Defense Information Systems Agency courses on DII COE (all)

Work-based:
- Develop DII COE compliant segments (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

8 Competency: **Computer Systems Architecture**

Strategic Value:

To provide secure information systems that are effective, interoperable, scalable, reliable, integrated and affordable.

Learning Objectives:

Understanding of computer system components and their functions, including component interfaces and associated services.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Computer systems architecture- Computer operation
- System design, including hardware components and configuration
- Data interchange services
- Database management
- Distributed processing
- Operating Systems
- Networks
- Systems software
- Computer design, including hardware components, configuration and interface
- Cryptographic equipment and systems
- DoD Security Architecture (MSL)
- Specifications and uses of embedded computers

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

9 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to protect information and information systems by ensuring their availability, authentication, confidentiality and integrity.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Information Systems Security
- Systems Analysis
- Systems Operation
- Systems Evaluation
- Systems Certification
- Countermeasures
- Internal and External Technical Advisement
- National Level IM/IT Policy
- Cryptography
- Common criteria, DITSCAP
- Assurance evidence
- Discretionary and Mandatory Access Control

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Managing Information Security (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- NETg Technical Training Courses (all)

Work-based
:- Serve as an Information System Security Officer (ISSO) or assist the ISSO (J)
- Develop security plans and/or policies (J, S)
- Analyze security software, hardware support tools (I)
- Conduct or assist in system risk assessments (I, J)
- Conduct system vulnerability tests (J)
- Perform or assist in system security certification and accreditation (I, J)
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

10 Competency: **Modeling and Simulation**

Strategic Value:

To evaluate and assess evolving information systems and to ensure greater efficiency, improved service, and cost effective operations.

Learning Objectives:

Knowledge of and ability to apply modeling and simulation tools and techniques to characterize systems of interest, to support decisions involving requirements, to evaluate design alternatives, to support training, or to support operational preparation.

Proficiency:		Level:					
Current	Required	E	I	J	S	Ex	Skill Topics:
0 1 2 3 4	0 1 2 3 4	X	X	X	X		- Analytic modeling (includes methods and tools) - Time-step simulation - Event-step simulation - Trace capture/playback - Remote terminal emulation - Database sampling - Test data generators - Protocols for federated models (e.g., DIS, ALSP, HLA)

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend M&S conferences (I, J)

Work-based:
- Visiting other DoD/civilian sites to learn about modeling and simulation (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

11 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
 --Information Management Planning
 --Information Technology Acquisition for the CIO
 --IT Project Management
- STAR Program (all)- DAWIA (all)

Work-based:
- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Data Management

12	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval- Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones - Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

1 Competency: **Systems Development**

Strategic Value:

To ensure that systems being developed meets functional requirements, are maintainable, secure, reliable, recoverable, on schedule and within cost.

Learning Objectives:

Knowledge of and ability to apply traditional and emerging design methodologies and programming services for developing information technology products and systems.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	

Skill Topics:

- DoD policies and guidelines
- Database architecture and DBMS
- Configuration management
- Network architecture and software
- Open systems and standards
- CASE methodology and tools
- Operating systems
- Programming languages and coding
- Object-oriented technology
- Software, hardware and system testing
- Quality assurance
- Business Process Reengineering
- Software reuse
- Software metrics
- Common criteria, DITSCAP

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (J)
- DAWIA systems engineering courses (J, S)

Work-based:
- Technical work in systems development (J, S)

Gap Assessment:

Required Proficiency	-	Current Proficiency	=	Gap
_____	-	_____	=	____

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

2 Competency: **Systems Acquisition**

Strategic Value:

To ensure the organization's products and services reflect scalable customer requirements, both cost and technical, in a competitive environment, and to ensure these requirements are met through the acquisition process.

Learning Objectives:

Knowledge of and ability to apply Federal, DoD and DON acquisition management guidance and analytical methods to formally plan, organize, direct and control the program and project acquisition process.

Developmental Opportunities:

Learning:
- Information Resources Management College: (all)
  -- Information Management Planning
  -- Critical Information System Technologies
- Information Resources Management College, Information Technology Acquisition for the CIO (S, Ex)
- DAWIA program management courses (J, S, Ex)

Work-based:
- Experience in acquisition programs (J, S, Ex)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Procurement processes
- Acquisition documentation
- Life-cycle management
- Economic analysis principles
- Activity-based costing
- DoD, DON budget and procurement processes
- BPR methodologies, metrics, tools, and techniques
- Plan and budgetary document development to support requirements
- Metrics and performance analysis
- Acquisition, Distribution and Disposal
- Federal laws and DoD, DON regulations

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

3	Competency: **Info. Technology, Info. Mgmt., Knowledge Mgmt.**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure organization information resources are strategic assets that will provide the backbone of DON decision-making needs by utilizing information and knowledge resources most effectively.*	Learning Objectives: Knowledge of and ability to manage information, knowledge, information technology and related resources according to Federal laws and DoD, DON regulations.	0 1 2 3 4	0 1 2 3 4			X	X	X	- Information management - Information resource management - Computing and Communications - IM/IT acquisition - Information resource management regulations, policies and procedures - Knowledge Management - Leadership - Performance assessment - Capital planning and investment - Technology advances - Strategic planning - Process/change management - IM/IT architecture - Information Assurance
	Developmental Opportunities: Learning: - Information Resources Management College, CIO Certificate Program (J, S, Ex) - Federal CIO Council, CIO University (S, Ex)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

4	Competency: **Business Development**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	- Marketing - Customer business requirements - Competitive proposal preparation and presentation - Customer service - Business case analysis - Stakeholder mediation
Strategic Value: *To sustain the structure and operations of the organization within projected cost and revenue, and to ensure requirements for planned growth and technology insertion are met with adequate capital investment resources.*	Learning Objectives: Knowledge of and ability to apply financial management, cost and revenue projections, business cases, plans, methods, practices, policies and procedures, industry trends and market surveys, justifications, approvals, determinations and findings.	0 1 2 3 4	0 1 2 3 4			X	X		
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (J) - Managerial Accounting Course (all) - Financial management course (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

5	Competency: **Quality Assurance**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To design, develop and deploy high quality systems by employing tools and methods that manage the system evolution.*	Learning Objectives: Knowledge of and ability to apply principles, methods and tools of quality assurance; includes translating functional requirements into technical requirements used for logical design or presenting alternative technologies or approaches.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		- Stakeholder requirements - Testing processes and procedures - OT&E - DT&E - IV&V - Performance measurement - Software metrics - Design reviews
	Developmental Opportunities: Learning: - Center for Quality Management courses (all) - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

6 Competency: **Configuration Management**

Strategic Value:

To ensure sound configuration management processes are established for information systems, to document mission support software and systems and to manage the configuration of existing networks.

Learning Objectives:

Knowledge of and ability to identify, track (status accounting), control, and document information and physical characteristics of an information system or product (including documentation during a system's life cycle).

Proficiency:		Level:					
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	

Skill Topics:

- Configuration management tools and methods
- Tracking (status accounting), controlling and documenting information and physical characteristics of an information system or product
- Configuration reviews and functional and physical auditing
- DoD policies and guidelines
- Protection of software (trusted)

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (J)
- Attend formal CM training (E, I)
- Attend CM conferences (I, J, S)

Work-based:
- Participate in writing of CM plan (I, J)
- Participate in a CM audit (I, J)
- Serve on a configuration control board (I, J)
- Attend a CCB meeting (E)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

7	Competency: **Risk Management**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	- Risk management policies and procedures - Hardware/software risks and vulnerabilities - Risk management methods and tools
Strategic Value: *To evaluate information systems to identify residual risks to make recommendations to meet the appropriate organizational requirements.*	Learning Objectives: Knowledge of and ability to use methods and tools used for risk assessment and mitigation of risk to information systems and data.	0 1 2 3 4	0 1 2 3 4			X	X	X	
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (J) - STAR Program (all) - DAWIA (all) Work-based: - Serve as Contracting Officer's Representative (J, S)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

8 Competency: **Architecture**

Strategic Value:

To provide secure information systems that are efficient, effective, interoperable, scalable, reliable, integrated and affordable.

Learning Objectives:

Understanding the operational, systems and technical views of the architecture framework endorsed by DoD, and their application in computer and information systems components.

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- OMB Memo M-97-16
- C4ISR architecture framework
- Process modeling
- Data interchange services
- Computer systems architecture
- System design, including hardware components and configuration
- Database management
- Distributed processing
- Operating Systems
- Networks
- Systems software
- Technical Standards--their role and specific standards in use and adopted by DoD and DON
- Cryptographic equipment and systems
- DoD Security Architecture (MSL)

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

9	Competency: **Business Process Reengineering**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure the organization's methods and processes support customer requirements, both cost and technical.*	Learning Objectives: Knowledge of and ability to apply analytical methods and procedures to review and assess information management processes and procedures to support the development and enhancement of administrative processes, procedures and organizations.	0 1 2 3 4	0 1 2 3 4		X	X	X	X	- Economic analysis principles - Activity-based costing - DoD and DON budget and procurement processes - BPR methodologies, metrics, tools and techniques - Automated information systems for specific computer projects - Plan and budgetary document development to support requirements - Continuous improvement principles
	Developmental Opportunities: Learning: - DoD BPR Certificate Program (all) - Information Resources Management College: (all) -- Reengineering Organizational Processes -- Information Measuring Results of Organizational Performance- Information Resources Management College, Critical Information System Technologies (E, I, J) - Attend business process reengineering course (I, J) - Attend creative thinking seminar (I) - Attend BPR conferences (I, J, S) Work-based: - Participate in BPR team (I, J) - Lead BPR effort (J, S)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

10 Competency: **E-Business**

Strategic Value:

To conduct business in an integrated and automated paperless information environment

Learning Objectives:

Knowledge of and ability to develop and apply electronic commerce tools and electronic data interchange policy, practices, standards, and procedures.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Electronic mail
- Electronic bulletin board systems
- Electronic funds transfer
- Business Process Evaluation/Reengineering
- Economic/Cost Benefit Analysis
- Project Planning/Development
- Enterprise Integration/Implementation
- EC/EDI Standards Coordination/Development Support
- Training and awareness
- WWW development and support

Developmental Opportunities:

Learning:
- Information Resources Management College, Data Management Strategies and Technologies: A Managerial Perspective (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Information Resources Management College, Strategic Management of Websites (I, J, S)
- Attend electronic commerce web design course (E, I)

Work-based:
- Provide engineering support to electronic commerce project (E, I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

11	Competency: **Life Cycle Management**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	- Project Planning - AIS Life Cycle Management
Strategic Value: *To ensure adherence to Federal law and DOD Life Cycle regulations in the acquisition, maintenance, operation and disposal of required hardware, support services and other materials.*	Learning Objectives: Knowledge of and ability to acquire required hardware, software, support services and other materials.	0 1 2 3 4	0 1 2 3 4		X	X	X		
	Developmental Opportunities: Learning: - Information Resources Management College, Information Management Planning (all) - Information Resources Management College, Information Technology Acquisition for the CIO (S) - Information Resources Management College, Critical Information System Technologies (I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

12 Competency: **Requirements Management**

Strategic Value:

To ensure stakeholder (e.g. customers, end-users) requirements are incorporated in the systems engineering of information systems.

Learning Objectives:

Knowledge of and ability to analyze, identify, specify and manage functional and infrastructure requirements needed to achieve customer, organization and DON goals.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD mission, organization and roles
- DoD Components' (Services and Agencies) missions, organizations and roles
- Unified Command structure, mission and roles
- Mission support requirements
- Analysis tools and methods
- Stakeholder requirements
- Operations and logistics requirements
- Security requirements

Developmental Opportunities:

Learning:
- Attend course on Requirements Specification (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Work on specification writing team (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

13 Competency: **Standards**

Strategic Value:

To promote interoperability, security, portability and scalability by ensuring requirements are inserted into standards development efforts, developing standards profiles and promoting the development of standards compliant products.

Learning Objectives:

Knowledge of and ability to develop and maintain standards and to influence standards development and standards development bodies.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Standards development process
- Standards development bodies
- Standards-based open systems architecture
- Reference models
- Profiles of standards (e.g., DoD Technical Reference Model, Technical Architecture Framework for Information Management, Information Technology Standards Guidance, IEEE Open Systems Reference Model, NIST Applications Portability Profile)
- Test & Evaluation
- Reference Implementations
- Standards compliance
- Standards selection

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend specific courses on standards (E, I, J)
- Attend standards symposiums and technical conferences (I, J)
- Subscribe to technical journals (E, I, J, S)

Work-based:
- Serve on standards committees (J, S)
- Serve on staff positions related to standards (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

14 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
  --Information Management Planning
  --Information Technology Acquisition for the CIO
  --IT Project Management- STAR Program (all)
- DAWIA (all)

Work-based:
- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

15	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval - Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones - Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Project Management

16 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

1	Competency: **Basic Scientific Research**	Proficiency:		Level:					Skill Topics:
Strategic Value: *To conduct basic scientific research to support future DON information systems.*	Learning Objectives: Knowledge of and ability to conduct cutting edge research and apply it to future DON needs.	Current	Required	E	I	J	S	Ex	- Publications and technical writing - Literature searches - Cooperative Research and Development Agreements (CRADAs) - Technical speech and presentation - Proposal development
		0 1 2 3 4	0 1 2 3 4			X	X		
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (J) - Classes for background as needed for new research topics (all) Work-based: - Conferences, workshops, presenting papers (all)- Professional study, journals, conference proceedings (all)- Professional association membership (all)- Program Chair / Committees (all)- Dissertation committees (all)- Organizational trends (S, Ex)- Evaluating proposals (S, Ex)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

2 Competency: **Applied Research**

Strategic Value:

To apply basic research in support of future DON information systems.

Learning Objectives:

Knowledge of and ability to conduct and apply cutting edge research and apply it to future DON needs.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	

Skill Topics:

- Requirements analysis
- Customer functional and infrastructure analysis
- Customer information management
- Customer requirements
- Converting research into prototype systems
- Transitioning from prototype systems to engineering development models
- Test & Evaluation
- Product design
- Systems integration
- CRADAs
- Liaison with universities, industry

Developmental Opportunities:

Learning:
- Information Resources Management College, \ (J)

Work-based:
- Conferences, workshops, presenting papers (all)
- Professional study, journals (all)
- Professional association membership (all)
- Program Chair / Committees (all)
- Dissertation committees (all)
- Organizational trends (S, Ex)
- Evaluating proposals (S, Ex)
- Investigate potential applications (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

3 Competency: **Advanced Concept Technology Demonstration**

Strategic Value:

To develop prototypes of advanced technology for use in future DON information systems.

Learning Objectives:

Knowledge of and ability to apply cutting edge research into advanced concept technology demonstrations.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Demonstrations and validation
- Customer requirements and support
- Training
- Graphical User Interface improvement
- Incremental development
- System integration and management
- Proposal development

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Conferences, workshops, presenting papers (all)
- Professional study, journals (all)
- Professional association membership (all)
- Program Chair / Committees (all)
- Dissertation committees (all)
- Organizational trends (S, Ex)
- Evaluating proposals (S, Ex)
- Investigate potential applications (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

4 Competency: **Requirements Analysis**

Strategic Value:

To ensure stakeholder (e.g. customers, end-users) requirements are incorporated in the systems engineering of information systems.

Learning Objectives:

Knowledge of and ability to analyze, identify, specify and manage functional and infrastructure requirements needed to achieve customer, organization and DON goals.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD mission, organization and roles
- DoD Components' (Services and Agencies) missions, organizations and roles
- Unified Command structure, mission and roles
- Mission support requirements
- Analysis tools and methods
- Stakeholder requirements
- Operations and logistics requirements
- Security requirements

Developmental Opportunities:

Learning:
- Attend course on Requirements Specification (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Work on specification writing team (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

5 Competency: **Modeling and Simulation**

Strategic Value:

To evaluate and assess evolving information systems and to ensure greater efficiency, improved service, and cost effective operations.

Learning Objectives:

Knowledge of and ability to apply modeling and simulation tools and techniques to characterize systems of interest, to support decisions involving requirements, to evaluate design alternatives, to support training, or to support operational preparation.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Analytic modeling (includes methods and tools)
- Time-step simulation
- Event-step simulation
- Trace capture/playback
- Remote terminal emulation
- Database sampling
- Test data generators
- Protocols for federated models (e.g., DIS, ALSP, HLA)
- Simulation-based design

Developmental Opportunities:

Learning:
- Attend M&S conferences (I, J)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Visiting other DoD/civilian sites to learn about modeling and simulation (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

6 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management
- Publications and technical writing
- Literature searches
- Cooperative Research and Development Agreements (CRADAs)
- Technical speech and presentation
- Proposal development

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
  --Information Management Planning
  --Information Technology Acquisition for the CIO
  --IT Project Management
- STAR Program (all)
- DAWIA (all)

Work-based:
- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

7	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval - Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones- Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Research and Development

8 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:

Current	Required
0 1 2 3 4	0 1 2 3 4

Level:

E	I	J	S	Ex
X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

1 Competency: **Software Development**

Strategic Value:

To develop software, including software that must satisfy critical requirements, and to ensure that sound software development practices are in place for information systems, engineering programs, or projects.

Learning Objectives:

Knowledge of and ability to apply traditional and emerging design methodologies and programming services for developing software products and systems, including assurance products that demonstrate that critical properties have been satisfied.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Classes on programming languages (E, I, J)
- Classes in Software engineering (E, I, J)
- Class in capability maturity model (E, I, J)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Participate in in-house software development project (E, I)
- Lead in house software development team (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Software development life cycle phases
- Traditional and emerging design methodologies for software production and system development
- DoD policies and guidelines
- Information engineering
- Database architecture and software
- Network architecture and software
- Open systems and software standards
- Object oriented design methodologies
- Operating systems
- Programming languages and coding
- Software testing and quality assurance
- Business Process Engineering (BPE) and Reengineering (BPR)
- Software systems engineering
- Applications configuration management
- SEI Capability Maturity Model
- Common criteria, DITSCAP-Formal specifications, theorem provers, etc.

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

2 Competency: **Software Reuse**

Strategic Value:

To locate, assess and reutilize software components and to determine effectiveness of generalizing existing applications for wider use. To develop software and software architectures that are reusable.

Learning Objectives:

Knowledge of and ability to reuse software components across multiple applications. Knowledge of and ability to use software standards, architectures, and software engineering methodologies that produce reusable software.

Developmental Opportunities:

Learning:
- Attend re-use briefings at software engineering conferences (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Browse through existing software repositories (E, I)
- identify possible reusable components within existing software (I)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Software reuse
- Defense Software Repository System
- Information systems engineering
- Domain engineering- Government and commercial reuse repositories
- Software components
- Application systems
- Interface services
- DoD, Federal Government and DON policies, guidelines and practices governing software reuse
- Asset management
- Quality assurance
- Reusable assets (e.g., process models, architectures, guidelines, code, data)
- Software repositories
- Case based reasoning
- Indexing methods (libraries)

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

3	Competency: **Computer Aided Software Engineering (CASE)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure sound engineering principles are followed and security is incorporated throughout the software/computer system life cycle (e.g., requirements analysis, systems development, reengineering, software development, operational testing, and maintenance).*	Learning Objectives: Knowledge of and ability to apply DoD and DON approved automated tools and methodologies for software engineering.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		- DoD Integrated CASE tools - CASE methodologies - BPA/BPE/BPR - Automated testing - Software and system development life cycle - Requirements analysis - Systems development - Reengineering
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

4 Competency: **Human Computer Interface**

Strategic Value:

To provide guidance to system developers in areas such as design, operation and maintenance of displays, operator controls and training programs. To ensure human computer interfaces are designed for usability with the needs, capabilities, and limitations of the users in mind and in accordance with DoD regulations.

Learning Objectives:

Knowledge of and ability to apply human factors principles, methods, tools and guidance.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Human factors principles, methods and tools
- Human-machine systems (human-in-the-loop)
- Human factors engineering
- Design, operation and maintenance of displays, operator controls, and training programs
- Ergonomics
- Safety
- Federal and DoD human-computer interface regulations and guidelines
- Human factors engineering principles
- Accessibility
- Human subjects experiments

Developmental Opportunities:

Learning:
- Attend Human Computer Interface conferences (I, J)
- Take human factors engineering course (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

5 Competency: **Common Operating Environment**

Strategic Value:

To enable the continued development of applications that run on the Defense Information Infrastructure Common Operating Environment (DII COE), to promote standard interfaces and to promote interoperability.

Learning Objectives:

Knowledge of and ability to apply a theoretical and practical understanding of the Joint Technical Architecture and the Common Operating Environment.

Proficiency:		Level:					
Current	Required	E	I	J	S	Ex	
0 1 2 3 4	0 1 2 3 4		X	X	X		

Skill Topics:

- Systems architectures
- Software Engineering
- Applications engineering
- Data engineering
- Information assurance
- Other IT skills (OS, systems interoperability and COE compliance, open systems standards, object oriented technology, multimedia, groupware technology, large scale systems)

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)
- Defense Information Systems Agency courses on DII COE (all)

Work-based:
- Develop COE compliant segments (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

6 Competency: **Computer Systems Architecture**

Strategic Value:

To provide secure information systems that are effective, interoperable, scalable, reliable, integrated and affordable.

Learning Objectives:

Understanding of computer system components and their functions, including component interfaces and associated services.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Computer systems architecture- Computer operation
- System design, including hardware components and configuration
- Data interchange services
- Database management
- Distributed processing
- Operating Systems
- Networks
- Systems software
- Computer design, including hardware components, configuration and interface
- Cryptographic equipment and systems
- Specifications and uses of embedded computers

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

7 Competency: **Requirements Management**

Strategic Value:

To ensure stakeholder (e.g. customers, end-users) requirements are incorporated in the systems engineering of information systems.

Learning Objectives:

Knowledge of and ability to analyze, identify, specify and manage functional and infrastructure requirements needed to achieve customer, organization and DON goals.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD mission, organization and roles
- DoD Components' (Services and Agencies) missions, organizations and roles
- Unified Command structure, mission and roles
- Mission support requirements
- Analysis tools and methods
- Stakeholder requirements
- Operations and logistics requirements
- Security requirements

Developmental Opportunities:

Learning:
- Attend course on Requirements Specification (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Work on specification writing team (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

8 Competency: **Configuration Management**

Strategic Value:

To ensure sound configuration management processes are established for information systems, to document mission support software and systems and to manage the configuration of existing networks.

Learning Objectives:

Knowledge of and ability to identify, track (status accounting), control, and document information and physical characteristics of an information system or product (including documentation during a system's life cycle).

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Attend formal CM training (E, I)
- Attend CM conferences (I, J, S)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Participate in writing of CM plan (I, J)
- Participate in a CM audit (I, J)
- Serve on a configuration control board (I, J)
- Attend a CCB meeting (E)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Status accounting
- Product documentation during life cycle
- Specification/standard validation
- Configuration management methods and tools
- Identifying an information system or product
- Tracking (status accounting) for an information system or product
- Controlling an information system or product
- DoD, DON policies and guidelines
- Documenting information and physical characteristics of an information system or product
- Configuration reviews and functional and physical auditing
- Protect software in development from insertion of malicious code

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

9	Competency: **System Integration**	Proficiency:		Level:					Skill Topics:
Strategic Value: *To manage the integration of subsystems into a system.*	Learning Objectives: Knowledge of and ability to integrate large information systems.	Current	Required	E	I	J	S	Ex	- Integration methods, tools and metrics - System interoperability - Software portability - Software scalability - System security - System and interface testing - DoD and DON Enterprise migration strategies
		0 1 2 3 4	0 1 2 3 4			X	X	X	
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (J) - System engineering course (J) - Attend system engineering symposia (J, S) - Present at system engineering symposia (S, Ex) Work-based: - Participate in interface design specification (J) - Participate in integration testing (J) - Management and supervisor training courses (J, S, Ex)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

10 Competency: **Standards**

Strategic Value:

To promote interoperability, security, portability and scalability by ensuring requirements are inserted into standards development efforts, developing standards profiles and promoting the development of standards compliant products.

Learning Objectives:

Knowledge of and ability to develop and maintain standards and to influence standards development and standards development bodies.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Standards development process
- Standards development bodies
- Standards-based open systems architecture
- Reference models
- Profiles of standards (e.g., DoD Technical Reference Model, Technical Architecture Framework for Information Management, Information Technology Standards Guidance, IEEE Open Systems Reference Model, NIST Applications Portability Profile)
- Test & Evaluation
- Reference Implementations
- Standards compliance
- Standards selection

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend courses on standards (E, I)
- Attend standards symposiums and technical conferences (I, J)
- Subscribe to technical journals (E, I, J, S)

Work-based:
- Serve on standards committees (J, S, Ex)
- Serve on staff positions related to standards (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

11 Competency: **Testing**

Strategic Value:

To ensure that systems perform in accordance with specified requirements.

Learning Objectives:

Knowledge of and ability to design and implement software testing to ensure software meets operational requirements.

Proficiency:		Level:					Skill Topics:
Current	Required	E	I	J	S	Ex	- System verification and validation - System performance inspection, analysis, simulation, demonstration and testing - Requirements tracking - Analysis and simulation - IV&V - Formal systems specification - Fault tree analysis - Software testing design - Software testing procedures
0 1 2 3 4	0 1 2 3 4	X	X	X	X		

Developmental Opportunities:

Learning:
- Attend testing conferences (I, J, S)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Develop test procedures for software development activity (E, I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

12	Competency: **Life Cycle Management**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	- Project Planning - AIS Life Cycle Management
Strategic Value: *To ensure adherence to Federal law and DOD Life Cycle regulations in the acquisition, maintenance, operation and disposal of required hardware, support services and other materials.*	Learning Objectives: Knowledge of and ability to acquire required hardware, software, support services and other materials.	0 1 2 3 4	0 1 2 3 4		X	X	X		
	Developmental Opportunities: Learning: - Information Resources Management College, Information Management Planning (all) - Information Resources Management College, Information Technology Acquisition for the CIO (S) - Information Resources Management College, Critical Information System Technologies (I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

13 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
  --Information Management Planning
  --Information Technology Acquisition for the CIO
  --IT Project Management
- STAR Program (all)
- DAWIA (all)

Work-based:
- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

14	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval- Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones - Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Software Engineering

15 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Administration

1 Competency: **Computer Operations Management**

Strategic Value:

To ensure that support for around-the-clock information transfer, storage and processing is timely, efficient, and meets the service levels required by a world-wide customer base.

Learning Objectives:

Knowledge of and ability to apply information technology, business, metrics, and personnel management methods in the operation of information systems and/or computer centers.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4		X	X		

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Troubleshoot system fixes (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Information systems
- Information system modeling methods
- Capacity planning
- Migration strategy development
- Problem resolution
- Troubleshooting
- Customer service
- Modeling and simulation
- Statistics/sampling
- Graphical data analysis
- Queuing systems
- Optimization techniques
- Cost/benefit analysis
- Life-cycle cost analysis
- Configuration management
- Security
- Standards and regulations

Career Area: Computer and Information Systems Engineering

Job Role: Systems Administration

2 Competency: **Network Management**

Strategic Value:

To ensure the operational integrity of networked automated information systems.

Learning Objectives:

Knowledge of and ability to apply operational performance monitoring, configuration management, fault detection and isolation, security management, and corrective action on information systems, networks, circuits, and equipment.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X		

Skill Topics:

- Operational performance
- Configuration management
- Fault detection and isolation
- Security management
- Network management hardware and software
- Interface problems in network management software systems
- Contingency plans and procedures
- Security

Developmental Opportunities:

Learning:
- Information Resources Management College, Global Enterprise Networking and Telecommunications (all)
- Attend university/commercial network operations course (E, I)
- Information Resources Management College, Critical Information System Technologies (all)

Work-based:
- Work as network administrator for operational session (I, J)
- Troubleshoot system fixes (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Administration

3	Competency: **Computer Systems Architecture**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To provide secure information systems that are effective, interoperable, scalable, reliable, integrated and affordable.*	Learning Objectives: Understanding of computer system components and their functions, including component interfaces and associated services.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		- Computer design - Computer operation - System design, including hardware components and configuration - Data interchange services - Database management - Database design (logical/physical) - Distributed processing - Documentation - Systems software (specific) - Networks - Open systems - Specifications and uses of embedded computers
	Developmental Opportunities: Learning: - Information Resources Management College, Managing Information Architectures and Infrastructures (all) - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Systems Administration

4 Competency: **Operational Test & Evaluation (OT&E)**

Strategic Value:

To plan, test, and evaluate information systems from an operational viewpoint.

Learning Objectives:

Knowledge of and ability to analyze operational and technical characteristics, identify critical operational issues, and define, document, implement, execute and report results.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X		

Skill Topics:

- Operational characteristics of computer systems
- Technical characteristics of computer systems
- Critical operational issues
- OT&E programs
- System design, prototypes/modeling, test methodologies, metrics and applications
- Test results analysis
- System documentation
- Standards and regulations
- Evaluation metrics

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (all)

Work-based:
- Evaluation metrics used at other sites (all)
- Troubleshoot system fixes (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Administration

5	Competency: **Business Development**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To sustain the structure and operations of the organization within projected cost and revenue, and to ensure requirements for planned growth and technology insertion are met with adequate capital investment resources.*	Learning Objectives: Knowledge of and ability to apply financial management, cost and revenue projections, business cases, plans, methods, practices, policies and procedures, industry trends and market surveys, justifications, approvals, determinations and findings.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Marketing - Customer business requirements - Competitive proposal preparation and presentation - Customer service - Business case analysis - Stakeholder mediation
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Systems Administration

6 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:

Current	Required
0 1 2 3 4	0 1 2 3 4

Level:

E	I	J	S	Ex
X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

1 Competency: **Requirements Analysis**

Strategic Value:

To ensure stakeholder (e.g. customers, end-users) requirements are incorporated in the systems engineering of information systems.

Learning Objectives:

Knowledge of and ability to identify, specify, analyze and manage stakeholders' functional and infrastructure requirements.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD mission, organization and roles
- DoD Components' (Services and Agencies) missions, organizations and roles
- Unified Command structure, mission and roles- Mission support requirements
- Analysis tools and methods
- Stakeholder requirements
- Operations and logistics requirements
- Security requirements

Developmental Opportunities:

Learning:
- Attend course on Requirements Specification (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Work on specification writing team (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

2 Competency: **Modeling and Simulation**

Strategic Value:

To evaluate and assess evolving information systems and to ensure greater efficiency, improved service, and cost effective operations.

Learning Objectives:

Knowledge of and ability to apply modeling and simulation tools and techniques to characterize systems of interest, to support decisions involving requirements, to evaluate design alternatives, to support training, or to support operational preparation.

Developmental Opportunities:

Learning:
- Attend M&S conferences (I, J)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Visiting other DoD/civilian sites to learn about modeling and simulation (all)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Analytic modeling (includes methods and tools)
- Time-step simulation
- Event-step simulation
- Trace capture/playback
- Remote terminal emulation
- Database sampling
- Test data generators- Protocols for federated models (e.g., DIS, ALSP, HLA)

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

3 Competency: **Architecture**

Strategic Value:

To provide secure information systems that are efficient, effective, interoperable, scalable, reliable, integrated and affordable.

Learning Objectives:

Understanding the operational, systems and technical views of the architecture framework endorsed by DoD, and their application in computer and information systems components.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- OMB Memo M-97-16
- C4ISR architecture framework
- Process modeling
- Data interchange services
- Computer systems architecture
- System design, including hardware components and configuration
- Database management
- Distributed processing
- Operating Systems- Networks
- Systems software
- Technical Standards--their role and specific standards in use and adopted by DoD and DON
- Cryptographic equipment and systems- DoD Security Architecture (MSL)

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

4 Competency: **Human Computer Interface**

Strategic Value:

To develop human computer interfaces that are designed for usability with the needs, capabilities, and limitations of the users in mind, and in accordance with the DoD regulations.

Learning Objectives:

Knowledge of and ability to apply human factors principles, methods, tools and guidance.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Automated systems usability design
- Design, operation and maintenance of displays, operator controls, and training programs
- Human factors engineering principles
- Accessibility
- Human subjects experiments

Developmental Opportunities:

Learning:
- Attend Human Computer Interface conferences (I, J)
- Take human factors engineering course (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

5 Competency: **Operations Research**

Strategic Value:

To assist customers in information systems assessment, planning, design, modifications, and strategy development.

Learning Objectives:

Knowledge of and ability to perform design, trade off and cost benefit analysis, and to evaluate and optimize information systems.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Attend courses in operations research (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Modeling methods
- Correlation analysis
- Analysis of variance
- Parameter estimation from statistical samples
- Parametric and nonparametric test of significance
- Principal component analysis
- Monte-Carlo analysis
- Analytical hierarchical process
- Decision support
- Bayesian inferencing
- Automated statistical evaluation packages (e.g., SAS, SYSTAT, S-PLUS, SPSS, STATISTICA)
- Graphical presentations/visualization- Spread sheet programs (e.g., Excel, 1-2-3)
- Sampling theory
- Data structures
- Scalability
- Queuing theory
- Constraint satisfaction
- Integer programming

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

6 Competency: **Configuration Management**

Strategic Value:

To track and document changes to information systems to ensure system and product characteristics conform to validated standards and standard profiles, and to support systems operations and trouble shooting.

Learning Objectives:

Knowledge of and ability to identify, track (status accounting), control, and document information and physical characteristics of an information system or product (including documentation during a system's life cycle).

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X		

Skill Topics:

- Software repository information
- Hardware configuration administration
- Network management tools
- Software and hardware configuration management tools
- Information systems software and hardware configuration modifications
- Software metrics for status accounting of change management and process control
- Configuration management standards, plans and policies
- Problem reporting and analysis

Developmental Opportunities:

Learning:
- Attend formal CM training (E, I)
- Attend CM conferences (I, J, S)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Participate in writing of CM plan (I, J)
- Participate in a CM audit (I, J)
- Serve on a configuration control board (I, J)
- Attend a CCB meeting (E)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

7	Competency: **Computer Aided Software Engineering (CASE)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	- DoD Integrated CASE tools - CASE methodologies - BPA/BPE/BPR
Strategic Value: *To automate, test and evaluate portions of the software and system development life-cycle in order to ensure sound engineering principles throughout the entire computer system life cycle (e.g., requirements analysis, systems development, reengineering, software development, operational testing, and maintenance).*	Learning Objectives: Knowledge of and ability to apply DoD and DON approved automated tools and methodologies for software engineering.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

8 Competency: **Business Process Reengineering**

Strategic Value:

To ensure the organization's methods and processes support customer requirements, both cost and technical.

Learning Objectives:

Knowledge of and ability to apply analytical methods and procedures to review and assess information management processes and procedures to support the development and enhancement of administrative processes, procedures and organizations.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4		X	X	X	X

Skill Topics:

- Economic analysis principles
- Activity-based costing
- DoD and DON budget and procurement processes
- BPR methodologies, metrics, tools and techniques
- Automated information systems for specific computer projects
- Plan and budgetary document development to support requirements
- Continuous improvement principles

Developmental Opportunities:

Learning:
- DoD BPR Certificate Program (all)
- Information Resources Management College: (all)
  -- Reengineering Organizational Processes
  -- Information Measuring Results of Organizational Performance- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Attend business process reengineering course (I, J)
- Attend creative thinking seminar (I)
- Attend BPR conferences (I, J, S)

Work-based:
- Participate in BPR team (I, J)
- Lead BPR effort (J, S)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

9 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
  --Information Management Planning
  --Information Technology Acquisition for the CIO
  --IT Project Management
- STAR Program (all)
- DAWIA (all)

Work-based:- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

10	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval - Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones - Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Systems Analysis

11 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

1 Competency: **Requirements Analysis**

Strategic Value:

To ensure stakeholder (e.g. customers, end-users) requirements are incorporated in the systems engineering of information systems.

Learning Objectives:

Knowledge of and ability to analyze, identify, specify and manage functional and infrastructure requirements needed to achieve customer, organization and DON goals.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD mission, organization and roles
- DoD Components' (Services and Agencies) missions, organizations and roles
- Unified Command structure, mission and roles
- Mission support requirements
- Analysis tools and methods
- Stakeholder requirements
- Operations and logistics requirements
- Security requirements

Developmental Opportunities:

Learning:
- Attend course on Requirements Specification (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Work on specification writing team (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

2 Competency: **Computer Systems Architecture**

Strategic Value:

To provide secure information systems that are effective, interoperable, scalable, reliable, integrated and affordable.

Learning Objectives:

Understanding of computer system components and their functions, including component interfaces and associated services.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Computer systems architecture
- Interfaces
- Computer system design including hardware components, configuration and interfaces
- Operating systems
- Systems software
- Data interchange services
- Distributed processing
- Networks
- Computer operation
- Database management
- Distributed processing
- DoD Security Architecture (MSL)
- Specifications and uses of embedded computers

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)

Gap Assessment:

_____	-	_____	=	_____
Required Proficiency	-	Current Proficiency	=	Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

3 Competency: **System Integration**

Strategic Value:

To manage the integration of subsystems into a system.

Learning Objectives:

Knowledge of and ability to integrate large information systems.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Integration methods, tools and metrics
- System interoperability
- Software portability
- Software scalability
- System security
- System and interface testing
- DoD and DON Enterprise migration strategies
- Analysis, identification and resolution of flaws
- Interface definition
- Interface configuration management

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (J)
- University/commercial system engineering courses (I)
- Attend system engineering symposia (I, J, S)
- Present at system engineering symposia (J, S)

Work-based:
- Participate in interface design specification (I)
- Participate in integration testing (I)
- Management and supervisor training courses (J, S, Ex)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

4 Competency: **Software Development**

Strategic Value:

To develop software, including software that must satisfy critical requirements, and to ensure that sound software development practices are in place for information systems, engineering programs, or projects.

Learning Objectives:

Knowledge of and ability to apply traditional and emerging design methodologies and programming services for developing software products and systems, including assurance products that demonstrate that critical properties have been satisfied.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Classes on programming languages (E, I, J)
- Classes in Software engineering (E, I, J)
- Class in capability maturity model (E, I, J)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Participate in in-house software development project (E, I)
- Lead in house software development team (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Software development life cycle phases
- Traditional and emerging design methodologies for software production and system development
- DoD policies and guidelines
- Information engineering
- Database architecture and software
- Network architecture and software
- Open systems and software standards
- Object oriented design methodologies
- Operating systems
- Programming languages and coding
- Software testing and quality assurance
- Business Process Engineering (BPE) and Reengineering (BPR)
- Software systems engineering
- Applications configuration management
- SEI Capability Maturity Model
- Common criteria, DITSCAP
- Formal specifications, theorem provers, etc.

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

5 Competency: **Software Reuse**

Strategic Value:

To locate, assess and reutilize software components and to determine effectiveness of generalizing existing applications for wider use. To develop software and software architectures that are reusable.

Learning Objectives:

Knowledge of and ability to reuse software components across multiple applications. Knowledge of and ability to use software standards, architectures, and software engineering methodologies that produce reusable software.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Attend re-use briefings at software engineering conferences (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Browse through existing software repositories (E, I)
- identify possible reusable components within existing software (I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Software reuse
- Defense Software Repository System
- Information systems engineering
- Domain engineering
- Government and commercial reuse repositories
- Software components
- Application systems
- Interface services
- DoD, Federal Government and DON policies, guidelines and practices governing software reuse
- Asset management
- Quality assurance
- Reusable assets (e.g., process models, architectures, guidelines, code, data)
- Software repositories
- Case based reasoning
- Indexing methods for selecting software (libraries)

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

6	Competency: **Computer Aided Software Engineering (CASE)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure sound engineering principles are followed and security is incorporated throughout the software/computer system life cycle (e.g., requirements analysis, systems development, reengineering, software development, operational testing, and maintenance).*	Learning Objectives: Knowledge of and ability to apply DoD and DON approved automated tools and methodologies for software engineering.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		- DoD Integrated CASE tools - CASE methodologies - BPA/BPE/BPR - Automated testing - Software and system development life cycle - Requirements analysis - Systems development - Reengineering
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

7	Competency: **Human Computer Interface**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To provide guidance to system developers in areas such as design, operation and maintenance of displays, operator controls and training programs. To ensure human computer interfaces are designed for usability with the needs, capabilities, and limitations of the users in mind and in accordance with DoD regulations.*	Learning Objectives: Knowledge of and ability to apply human factors principles, methods, tools and guidance.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		- Human factors principles, methods and tools - Human-machine systems (human-in-the-loop) - Human factors engineering - Design, operation and maintenance of displays, operator controls, and training programs - Ergonomics - Safety - Federal and DoD human-computer interface regulations and guidelines - Human factors engineering principles - Human subjects experiments - Accessibility
	Developmental Opportunities: Learning: - Attend Human Computer Interface conferences (I, J) - Take human factors engineering course (E, I) - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

8 Competency: **Common Operating Environment**

Strategic Value:

To enable the continued development of applications that run on the Defense Information Infrastructure Common Operating Environment (DII COE), to promote standard interfaces and to promote interoperability.

Learning Objectives:

Knowledge of and ability to apply a theoretical and practical understanding of the Joint Technical Architecture and the Common Operating Environment.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4		X	X	X	

Developmental Opportunities:

Learning:
- Information Resources Management College, Managing Information Architectures and Infrastructures (all)
- Information Resources Management College, Critical Information System Technologies (I, J)
- Defense Information Systems Agency courses on DII COE (all)

Work-based:
- Develop COE compliant segments (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Systems architectures (network, hardware, software, communications systems, distributes computing, client/server architectures)
- Software Engineering (software development and principles, tools and environments, software test and integration, software languages and metrics)
- Applications engineering (web applications design, requirements, traceability, software component reuse, performance engineering, system performance measures, software test & integration, software systems migration, software configuration management/change control, real time systems, human-machine interfaces)
- Data engineering (data structures, database management systems, database administration, data warehousing, middleware)
- Information assurance (network security, firewalls, boundary controllers, intrusion detection and response, access control, security management, systems certification)
- Other IT skills (OSs, systems interoperability and COE compliance, open systems standards, object oriented technology, multimedia, groupware technology, large scale systems)

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

9 Competency: **Network Engineering**

Strategic Value:

To create greater capacity, improved service, increased security and more cost effective operations; to provide detailed engineering needed to bring a modern, secure communications architecture to operational networks that can carry voice, video and/or imagery.

Learning Objectives:

Knowledge of and ability to design and redesign networks, implement and provide operational support for communications protocols and nodes (e.g., routers, voice switches, ATM) for combined voice, data and imagery.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (E, I, J)
- Information Resources Management College, Global Enterprise Networking and Telecommunications (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Network design
- Local Area Networks (LANs) and Wide Area Networks (WANs)
- Transmission networks
- Network communication and security protocols
- Client-server relationships
- Contingency, availability, and reliability issues
- Stand-alone hardware/software applications integration to LAN/WAN based applications
- Modeling and simulation techniques and tools
- Network directory services
- Voice, data, imagery, multimedia and/or video applications and systems
- Digital and analog switches
- Multiplexers, routers, gateways, servers
- Circuit and packet switched communications and architectures
- Operational networks
- Message switched networks
- Cryptographic equipment

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

10 Competency: **Integrated Network Management**

Strategic Value:

To provide network management systems to support the operation, administration and maintenance of voice, data, imagery and video networks.

Learning Objectives:

Knowledge of and ability to apply methods/tools to carry out operational performance monitoring, configuration management, fault detection and isolation, security management and corrective action on systems, networks, circuits and equipment.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X		

Skill Topics:

- Operational performance monitoring
- Configuration management
- Fault detection and isolation
- Security management
- Corrective action
- Telecommunications systems
- Networks, circuits and equipment

Developmental Opportunities:

Learning:
- Information Resources Management College, Global Enterprise Networking and Telecommunications (all)
- Information Resources Management College, Critical Information System Technologies (all)
- Attend university/commercial network operations course (E, I)

Work-based:
- Work as network administrator for operational session (I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

11 Competency: **Operational Test & Evaluation (OT&E)**

Strategic Value:

To plan, test and evaluate for the implementation of an information system from an operational viewpoint.

Learning Objectives:

Knowledge of and ability to analyze operational and technical characteristics, identify critical operational issues, and define, document, implement, execute and report results.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- OT&E methods and tools
- Technical performance processes
- Operational characteristics analysis
- Technical characteristics analysis, identification and definition
- Critical operational issues identification
- Test and Evaluation Master Plan (TEMP)
- Evaluation metrics

Developmental Opportunities:

Learning:
- Attend testing conferences (I, J)
- Attend courses on test design (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Evaluation metrics used at other sites (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

12 Competency: **Integrated Verification & Validation (IV&V)**

Strategic Value:

To ensure that systems perform in accordance with specified requirements.

Learning Objectives:

Knowledge of and ability to formally verify and validate by means of inspection, analysis, simulation, demonstration and testing.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- System verification and validation
- System performance inspection, analysis, simulation, demonstration and testing
- Requirements tracking
- Analysis and simulation
- IV&V
- Formal systems specification
- Fault tree analysis

Developmental Opportunities:

Learning:
- Attend testing conferences (I, J, S)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Participate in IV&V testing (E, I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

13 Competency: **Reliability**

Strategic Value:

To design, develop, and/or acquire systems that meet customers reliability needs.

Learning Objectives:

Knowledge of and ability to define reliability requirements, implement to meet requirements, test compliance, and address reliability failures.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Knowledge of operational systems reliability requirements
- Ability to calculate mean time between failures
- Knowledge of reliability, maintainability and availability fundamentals

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Work in-service support to develop appreciation of impact reliability failures have (E)
- Participate in reliability testing (E, I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

14 Competency: **Configuration Management**

Strategic Value:

To ensure sound configuration management processes are established for information systems, to document mission support software and systems, and to manage the configuration of existing networks.

Learning Objectives:

Knowledge of and ability to identify, track (status accounting), control, and document information and physical characteristics of an information system or product (including documentation during a system's life cycle).

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X		

Developmental Opportunities:

Learning:
- Attend formal CM training (E, I)
- Attend CM conferences (I, J, S)
- Information Resources Management College, Critical Information System Technologies (all)

Work-based:
- Participate in writing of CM plan (I, J)
- Participate in a CM audit (I, J)
- Serve on a configuration control board (I, J)
- Attend a CCB meeting (E)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Status accounting
- Product documentation during life cycle
- Specification/standard validation
- Configuration management methods and tools
- Identifying an information system or product
- Tracking (status accounting) for an information system or product
- Controlling an information system or product
- DoD, DON policies and guidelines
- Documenting information and physical characteristics of an information system or product
- Configuration reviews and functional and physical auditing
- Protect software in development from insertion of malicious code

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

15 Competency: **Operations Research**

Strategic Value:

To assist customers in information systems assessment, planning, design, modifications, and strategy development.

Learning Objectives:

Knowledge of and ability to perform design, trade off and cost benefit analysis, and to evaluate and optimize information systems.

Developmental Opportunities:

Learning:
- Attend courses in operations research (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Skill Topics:

- Modeling methods
- Correlation analysis
- Analysis of variance
- Parameter estimation from statistical samples
- Parametric and nonparametric test of significance
- Principal component analysis
- Monte-Carlo analysis
- Analytical hierarchical process
- Decision support
- Bayesian inferencing
- Automated statistical evaluation packages (e.g., SAS, SYSTAT, S-PLUS, SPSS, STATISTICA)
- Graphical presentations/visualization
- Spread sheet programs (e.g., Excel, 1-2-3)
- Sampling theory
- Constraint Satisfaction
- Integer Programming

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

16 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
  --Information Management Planning
  --Information Technology Acquisition for the CIO
  --IT Project Management
- STAR Program (all)
- DAWIA (all)

Work-based:
- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

17	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval - Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones - Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Systems Engineering

18 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

1	Competency: **Developmental Test & Evaluation (DT&E)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	- DT&E - Requirements and developmental analysis - Test coverage performance metrics - Quality assurance - Performance assurance - Product assurance - Standards conformance testing - Interoperability certification - Security testing - Human computer interface
Strategic Value: *To promote the development and acceptance of information systems to meet stakeholder requirements; to promote compliance with standards; to promote interoperability of standards compliant products in support of DON acquisition.*	Learning Objectives: Knowledge of and ability to analyze the technical characteristics, identify critical technical issues and design, implement, execute and report results.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		
	Developmental Opportunities: Learning: - Attend testing conferences, such as ITEA conference (I, J) - Attend courses on test design (E, I) - Information Resources Management College, Critical Information System Technologies (E, I, J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

2	Competency: **Integrated Verification & Validation (IV&V)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure that systems perform in accordance with specified requirements.*	Learning Objectives: Knowledge of and ability to formally verify and validate by means of inspection, analysis, simulation, demonstration and testing.	0 1 2 3 4	0 1 2 3 4	X	X	X	X		- Automated system performance characteristics - System inspection, analysis, simulation, demonstration and testing - IV&V tools and techniques - Formal systems specification - Fault tree analysis
	Developmental Opportunities: Learning: - Attend testing conferences (I, J, S) - Information Resources Management College, Critical Information System Technologies (E, I, J) Work-based: - Participate in IV&V testing (E, I)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

3	Competency: **Integration Testing**	Proficiency:		Level:					Skill Topics:
Strategic Value: *To achieve/test an integrated and interoperable system.*	Learning Objectives: Knowledge of and ability to test and ensure that multiple functional and technical components and modules have been integrated in an interoperable fashion.	Current	Required	E	I	J	S	Ex	- Functional and technical component and module integration - Interface problems in information system networks - Integrated system testing
		0 1 2 3 4	0 1 2 3 4	X	X	X			
	Developmental Opportunities: Learning: - Information Resources Management College, Critical Information System Technologies (all) Work-based: - Participate in system integration testing (E, I) - Act as test leader for integration testing (J)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

4 Competency: **Operational Test & Evaluation (OT&E)**

Strategic Value:

To plan, test and evaluate for the implementation of an information system from an operational viewpoint.

Learning Objectives:

Knowledge of and ability to analyze operational and technical characteristics, identify critical operational issues, and define, document, implement, execute and report results.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- OT&E methods and tools
- Technical performance processes
- Operational characteristics analysis
- Technical characteristics analysis, identification and definition
- Critical operational issues identification
- Test and Evaluation Master Plan (TEMP)
- Evaluation metrics

Developmental Opportunities:

Learning:
- Attend testing conferences, such as ITEA conference (I, J)
- Attend courses on test design (E, I)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Evaluation metrics used at other sites (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

5 Competency: **Quality Assurance**

Strategic Value:

To design, develop and deploy high quality systems by employing tools and methods that manage the system evolution.

Learning Objectives:

Knowledge of and ability to apply principles, methods and tools of quality assurance; includes translating functional requirements into technical requirements used for logical design or presenting alternative technologies or approaches.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Stakeholder requirements
- Testing processes and procedures
- OT&E
- DT&E
- IV&V
- Performance measurement
- Software metrics
- Design reviews

Developmental Opportunities:

Learning:
- Center for Quality Management courses (all)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

6 Competency: **Testing**

Strategic Value:

To ensure that systems perform in accordance with specified requirements.

Learning Objectives:

Knowledge of and ability to design and implement software testing to ensure software meets operational requirements.

Proficiency:		Level:					Skill Topics:
Current	Required	E	I	J	S	Ex	- System verification and validation - System performance inspection, analysis, simulation, demonstration and testing - Requirements tracking - Analysis and simulation - IV&V - Formal systems specification - Fault tree analysis - Software testing design - Software testing procedures
0 1 2 3 4	0 1 2 3 4	X	X	X	X		

Developmental Opportunities:

Learning:
- Attend testing conferences (I, J, S)
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Develop test procedures for software development activity (E, I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

7 Competency: **Reliability**

Strategic Value:

To design, develop, and/or acquire systems that meet customers reliability needs.

Learning Objectives:

Knowledge of and ability to define reliability requirements, implement to meet requirements, test compliance, and address reliability failures.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- Knowledge of operational systems reliability requirements
- Ability to calculate mean time between failures
- Knowledge of reliability, maintainability and availability fundamentals

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Work-based:
- Work in-service support to develop appreciation of impact reliability failures have (E)
- Participate in reliability testing (E, I)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

8 Competency: **Computer Aided Software Engineering (CASE)**

Strategic Value:

To ensure sound engineering principles are followed and security is incorporated throughout the software/computer system life cycle (e.g., requirements analysis, systems development, reengineering, software development, operational testing, and maintenance).

Learning Objectives:

Knowledge of and ability to apply DoD and DON approved automated tools and methodologies for software engineering.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	

Skill Topics:

- DoD Integrated CASE tools
- CASE methodologies
- BPA/BPE/BPR
- Automated testing
- Software and system development life cycle
- Requirements analysis
- Systems development
- Reengineering
- Human computer interface

Developmental Opportunities:

Learning:
- Information Resources Management College, Critical Information System Technologies (E, I, J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

9 Competency: **Program Management**

Strategic Value:

To achieve the needed outcomes of a specific program and related projects by ensuring proper management, performance and administration.

Learning Objectives:

Knowledge of the required outcomes, functional and political environments, organizations, activities, and constraints affecting a program. Knowledge of project definition and the ability to: relate required results and costs; lead teams that include members not in one's chain of command; apply systematic thinking to develop action plans; develop approaches to satisfy requirements and resolve issues; and ensure overall project quality. A PM has the knowledge and ability to coordinate the work of assigned staff and other functional experts matrixed to support the task.

Proficiency: Current	Proficiency: Required	Level: E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4			X	X	X

Skill Topics:

- Program strategic planning
- Program role in organization/enterprise
- Visionary leadership
- Performance assessment
- Project integration management
- Quality management
- Risk management
- Financial management

Developmental Opportunities:

Learning:
- Information Resources Management College: (J, S)
  --Information Management Planning
  --Information Technology Acquisition for the CIO
  --IT Project Management
- STAR Program (all)
- DAWIA (all)

Work-based:
- Serve as Contracting Officer's Representative (J, S)
- Serve as project engineer or project manager (J)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy:

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

10	Competency: **Contracting Officers Representative (COR)**	Proficiency:		Level:					Skill Topics:
		Current	Required	E	I	J	S	Ex	
Strategic Value: *To ensure contractor performance and delivery is in compliance with a given contract.*	Learning Objectives: Knowledge of and ability to make technical decisions within the scope of the contract/task; serve as the day-to-day point of contact for contractual matters; assess the technical quality of performed work; approve deliverables for acceptance.	0 1 2 3 4	0 1 2 3 4		X	X	X		- Deliverable item review and approval - Contract types (e.g., IDIQ, cost reimbursable, time and materials, firm fixed price) - Cost reporting - Contract rates - Delivery orders - Other direct costs (ODCs) - Contract Line Items (CLINs) - Contract milestones - Life cycle management - Statements of Work (SOW) - Contract options
	Developmental Opportunities: Learning: - STAR Program (all) - DAWIA (all)	Gap Assessment: _____ - _____ = _____ Required Proficiency - Current Proficiency = Gap Gap Mitigation Strategy:							

Career Area: Computer and Information Systems Engineering

Job Role: Test and Evaluation

11 Competency: **Information Assurance**

Strategic Value:

To acquire, maintain and ensure the security of information systems in an effective, interoperable, scalable, reliable, integrated and affordable fashion.

Learning Objectives:

Knowledge of and ability to apply physical access controls, technical security countermeasures, classification and safeguarding of controlled information and operational & industrial security. Ability to validate that appropriate countermeasures are being integrated correctly into program and to ensure that assurance evidence that demonstrates that the system is secure are produced.

Proficiency:		Level:				
Current	Required	E	I	J	S	Ex
0 1 2 3 4	0 1 2 3 4	X	X	X	X	X

Skill Topics:

- Information Systems Security
- National Level IM/IT Policy
- Trusted Systems
- Discretionary and Mandatory Access Control
- Identification and Authentication
- Common criteria, DITSCAP
- Assurance Evidence

Developmental Opportunities:

Learning:
- NETg Technical Training Courses (all)

Work-based:
- Partnering with Industry (all)

Gap Assessment:

_____ - _____ = _____

Required Proficiency - Current Proficiency = Gap

Gap Mitigation Strategy: